derived thru a dissection of this primitive ring by invasions of the parenchyma and by reduction of the bundle elements. He draws his proofs both from the known palaeontological types and from the development of some present-day herbaceous forms. He believes, therefore, that the exogenous herbs are of more modern development than the woody plants.

THE GROWTH OF SOMATIC CELLS WITHOUT THE BODY

M. T. Burrows (Jour. Exp. Zool., January, 1911; C. R., Soc. Biol. Paris, 1910,) continues the work of Harrison in cultivating dissociated cells of metazoa in coagulable lymph. He has succeeded in securing the growth of isolated tissues of chick embryos, and verified for the chick essentially what Harrison demonstrated for the tadpole—that nerve fibres grow directly from the nerve cells independently of the surrounding formations. Burrows was able to apply histological tests to the fibres. The fibres grow by the extension and retraction of the characteristic ameboid swellings that terminate them. The technic is complicated by the fact that the chick is warm-blooded.

In a similar way even adult tissues were made to grow successfully. The following tissues from dogs and cats grew under artificial conditions, both as to the specific differential cells of the organs and the connective tissue cells associated: the conjunctiva and the vascular and peritoneal endothelum; the lymphatic, thyroid and supra-renal glands; the spleen, the kidneys, the ovaries; cartilage and bone marrow.

It is worthy of note that such cultures only present cell growths; there seems to be no tendency for the cells to group themselves into their characteristic tissue forms.

ORIGIN OF ELEMENTS OF SYMPATHETIC SYSTEM

Kuntz (Jour. Comp. Neur., 1910,) discusses the origin and development of the sympathetic nervous system in birds and mammals. He concludes that the sympathetic system is homologous with the other functional divisions of the nervous system, has

arisen later in evolution, and in embryogenesis arises primarily by the migration of nervous elements from the cerebro-spinal system. These migrations of cells take place along the spinal nerves and the vagi. He looks upon the cells that migrate from the cerebro-spinal ganglia and from the neural tube as being homologous with those that give rise to the neuroglia and to the neurones of the central nervous system.

REGENERATION AND CELL DIVISION

Calkins (Jour. Exp. Zool., February, 1911,) gives an interesting account of regeneration in a large protozoan, *Uronychia,* especially as related to its normal cell divisions. It divides once in about thirty-six hours. He concludes that there is little or no power of regeneration immediately after division before the nucleus returns to its normal resting distribution. Even after six to twenty-four hours have elapsed the power of regeneration is limited, parts regenerating only when the micro-nucleus and a part of the macro-nucleus are both present.

On the contrary, during the whole dividing period the regenerative power is high. At this time both segments may regenerate, even without the micro-nucleus, tho the relation of the plane of the section to the plane of the oncoming division has some determinative effect upon the result. The cutting operation retards the cell-division, but the division continues in the original plane.

RED BLOOD CELLS

Roscoe W. King (Jour. Med. Research, January, 1911,) believes that he has conclusive evidence in support of the view that red blood cells of the circulating blood are derived from the erythroblasts of the capillaries of the red marrow by a process of intracellular nuclear degeneration. He has been able to demonstrate the remains of nuclear matter quite generally in the blood cells of normal blood. He also believes that blood platelets are extruded fragments of erythrocytic nuclei.